

Prairie Dog Ecology: Pre/Post Test

1. What role does the prairie dog play in the environment?
☐ provides food for other animals
☐ provides shelter and habitat for other animals
☐ improves the overall quality of a prairie ecosystem
☐ all of the above
2. What does the word ecology mean?
☐ a process through which an existing community is replaced by another
☐ the study of the interactions of organisms with one another and their physical surroundings
☐ environment that has a characteristic climax community
☐ the study of life (plants and animals especially)
3. What is a habitat?
☐ the place where an organism lives
☐ a place where animals go to find food
☐ a unique place where organisms go to find mates
☐ all of the above
4. Species diversity means that there are many individuals of the same species.
☐ True
☐ False
5. What does the term population mean?
☐ all of the different kinds (species) of organisms living in one specific area
☐ the number of all of the animals living in a given region
☐ group of organisms of the same species in a given area that can breed with one another
☐ all of the above
6. What does the term community mean?
☐ all of the same kind (species) of organisms living in one specific area
☐ all of the populations of organisms living in a given area
☐ group of organisms of the same species in a given area that can breed with one another
☐ all of the above
7. Extinction means that there are only a few remaining organisms of a given species.
☐ True
☐ False

8. Mutualism is where one organism benefits and the other one is unharmed.
☐ True
☐ False
9. Which is an example of a predator?
☐ red-tailed hawk
☐ black-footed ferret
☐ badger
☐ all of the above
10. About how many vertebrate species depend on the prairie dog for survival?
☐ 9
☐ 23
☐ 170
☐ 1800
11. Nutrients are essential elements (chemicals, compounds) that organisms need for survival.
☐ True
☐ False
12. Symbiosis refers to a close relationship between two species in which at least one benefits.
☐ True
☐ False
13. Parasitism is not an example of a symbiotic relationship.
☐ True
☐ False
14. Commensalism, mutualism and parasitism are all examples of kinds of symbiotic relationships.
☐ True
☐ False

ESSAY QUESTION

Write a short paragraph about why the prairie dog is considered to be a **Keystone species**.

Prairie Dog Ecology: Pre/Post Test Key

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Prairie Dog Ecology Notes

Prairie dogs play an important role in the ecology of North America. As a "pioneer species" like the antelope, bison and elk, the prairie dog is becoming a mere remnant on the short- and mixed-grass prairie throughout the country. The prairie dog has both aesthetic and functional value. They are food for some animals, and their activities enrich the soil and enhance the biodiversity of an area by providing shelter and habitat for other organisms.

The prairie dog is considered to be a keystone species. A keystone species (also called critical, target or umbrella species) is one whose disappearance will be followed by a decrease in species diversity in a community. Extinction of a keystone species can cause the extinction of other dependent species due to complex mutualistic relationships, and entire food webs may collapse. Due to reduced prairie dog populations, the black-footed ferret (*Mustela nigripes*), which depends on the prairie dog for food, is near extinction.

Prairie dog colonies provide a unique ecological sanctuary for other animals. Where prairie dogs occur, there are greater arthropod and smaller mammal populations, an increase in bird diversity and density, and greater predator populations. Burrowing owls (*Speotyto cunicularia*), and reptiles use prairie dog burrows for shelter and hibernation. Prairie dogs are food for many mammalian and avian predators such as the badger (*Taxidea taxus*) and red-tailed hawk (*Buteo jamaicensis*). About 170 vertebrate species are dependent on the prairie dog for survival.

Prairie dogs enhance habitat diversity by regulating plant species diversity and by enriching the soil. Burrowing alters soil structure and chemistry, which aerates and mixes organic material (plant and animal waste), into the soil. The nutrient content of the soil is increased and this enhances plant diversity and productivity. Constant grazing near burrows stimulates forb and grass regrowth, and grazed plants have a higher nutritional value than mature plants. Prairie dog grazing and plant regrowth attract livestock, bison and pronghorn to prairie dog colonies.

While prairie dogs do compete with livestock for food, the quality of vegetation eaten by cattle is improved, compensating (in terms of weight gain in cattle) for the quantity of food that is not available for livestock. Overgrazing by livestock (packed ground and removal of tall vegetation) create ideal habitat for prairie dogs to establish new colonies.

Historically, prairie dogs were dependent upon the grazing animals (antelope, bison and elk) for the establishment of habitat. In turn, the prairie dogs improved the habitat, which resulted in increased plant and animal diversity. Symbiotically, prairie dogs are a

mutualistic component of a complex ecological community that plays a vital role in maintaining a healthy prairie ecosystem.

Symbiosis

Symbiosis (sim-bi-oh-sis): close relationship between two species in which at least one species benefits from the other

There are three kinds of symbiotic relationships:

Mutualism - symbiosis in which two species live together in such a way that both benefit from the relationship

Commensalism - symbiosis in which one species benefits and the other is not harmed

Parasitism - symbiosis in which one species benefits and the other is harmed

Prairie Dog Ecology: Questions Related to Presentation
Work Sheet

1. What is the functional value of prairie dogs?
2. Define ecology.
3. What does biodiversity mean?
4. Define habitat.
5. What is a keystone species?
6. What does species diversity mean?
7. In terms of ecology, what is a community?
8. Define extinction.
9. Define mutualistic.
10. Define food webs (not a food chain).
11. In terms of ecology, what are populations?
12. How do prairie dog colonies benefit other animals?

13. Define predator.
14. Define hibernation.
15. About how many vertebrate species depend on the prairie dog for survival?
16. What is a vertebrate?
17. List some of the animals that are dependent on prairie dogs.
18. How do prairie dogs enhance habitat diversity in terms of plants and soil?
19. What are nutrients?
20. Why do plants grazed by prairie dogs have a higher nutritional value?
21. What is the relationship between livestock and prairie dogs in terms of competition and overgrazing?
22. Define symbiosis and ecosystem.

Prairie Dog Ecology: *The Mysterious Black-footed Ferret* Video
Work Sheet

1. In the opening scene, what animal does the black-footed ferret eat?
2. What other animals are shown living on the plains below the mountains?
3. What is the name of the state where these ferrets are living?
4. This ferret was thought to be extinct, but it was rediscovered in what year?
5. The black-footed ferret was thought to have become extinct in a black-tailed prairie dog town in South Dakota in what year?
6. How long is a grown black-footed ferret? How much does it weigh?
7. What is the purpose of the radio transmitter collar attached to the ferret?
8. How are ferret burrows different from badger burrows?
9. Is the black-footed ferret the only ferret native to North America?
10. Do black-footed ferrets have a close association with prairie dog towns?
11. What is the habitat for a black-footed ferret (its home - not the state)?
12. What is the name of the man that discovered the black-footed ferret?
13. What human disease can infect these ferrets?
14. Why was the ferret captured?
15. After vaccinating the ferret, the biologist examined the ferret for what kind of parasite?
16. Why did the biologist tattoo the ferret's ear?
17. About how many miles did the ferret's range cover?
18. Ferrets have a specific territory. How far do they travel in an evening's activities?
19. What is the primary predator of the black-footed ferret?

Prairie Dog Ecology: Relationships
Work Sheet

As a group, compile a list of animals that are dependent on the prairie dog for food, shelter, hibernation and habitat modification due to soil and plant interactions. Use this habitat list to help answer questions on the *Symbiosis* and *Food Web* work sheets.

Food	Shelter	Hibernation	Habitat Modification

Prairie Dog Ecology: Symbiosis
Work Sheet

Symbiosis (sim-bi-oh-sis) is the close relationship between two species in which at least one species benefits from the other.

The three kinds of symbiotic relationships are as follows:

Mutualism is symbiosis in which two species live together in such a way that both benefit from the relationship.

Commensalism is symbiosis in which one species benefits and the other is not harmed

Parasitism is symbiosis in which one species benefits and the other is harmed

Give an example of each kind of symbiotic relationship using the prairie dog and some other organism.

1. Mutualism Example

2. Commensalism Example

3. Parasitism Example

Prairie Dog Ecology: Food Webs
Work Sheet

In a food web, food chains are connected to each other. In groups of 4 students or less, use your *animal relationships work sheet* to help construct a food web for the black-tailed prairie dog. Draw arrows from the organism that is eaten to the one that ate it! Use the name of the animal and also draw it (or find pictures).

What endangered species depends on the prairie dog for food?